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| Use the Van de Walle text and the TN Math Standards to complete this assignment. If other resources are used in addition, please cite with the URL or bibliographic information. |

**Chapter 19 – Developing Measurement Concepts**

1. Data from international studies consistently indicate that U.S. students are weaker in the area of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than any other topic in the mathematics curriculum (Thompson & Preston, 2004). (p. 453)
2. What are the 3 steps to measure something? (p. 454)

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1. Connect the TN Math Content Standards to

Table 19.1 Measurement Instruction: A Sequence of Experiences (p. 455)

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| Step | Find at least one standard where the step is addressed  (Copy the standard–code & description– from <https://www.tn.gov/assets/entities/sbe/attachments/4-15-16_V_A_Math_Standards_Attachment.pdf>) |
| Make comparisons |  |
| Use physical models of measuring units |  |
| Use measuring instruments |  |

1. Define the word *tiling* when used in the context of using physical models of measuring units. (p. 455)
2. What is the benefit to students of creating simple measuring instruments rather than going straight to utilizing tools, such as rulers, to measure length? (p. 456)
3. What are three reasons for the use of nonstandard units for beginning measurement activities (p. 456)

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1. Perhaps the biggest error in measurement instruction is the failure to recognize and separate two types of objectives: (p. 456)

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1. Teaching standard units of measurement can be organized around 3 broad goals:

(Fill in the missing blanks from p. 456–457)

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| Broad Goal | Question to Accomplish the Goal |
| Familiarity with the unit |  |
|  | What is a reasonable measurement unit in a given situation and the required level of precision? |
| Knowledge of relationships between units |  |

1. Watch <https://www.youtube.com/watch?v=bWhWL1MET7A> of a reading for the book *How Big is a Foot*, then look carefully at the grade 2 standards for Measurement and Data found at <https://www.tn.gov/assets/entities/sbe/attachments/4-15-16_V_A_Math_Standards_Attachment.pdf>. Which standard(s) would you select for a lesson using this book?

* Copy the standard below:
* Explain your reasoning for choosing that standard.

1. Always begin a measurement activity with students making an estimate. Describe the specific strategies for estimating measures. (Fill in the blanks using p. 459–460)

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| Strategy | Description |
| Develop benchmark for referents |  |
|  | Using easier to calculate portions to estimate the whole |
| Iterate units |  |

1. List 3 common misconceptions students have about measuring length. (p. 461)

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*Conversion*

1. Larger units will produce a \_\_\_\_\_\_\_\_\_\_\_ measure; Smaller units will produce a \_\_\_\_\_\_\_\_\_\_ measure. (p. 464–465)

Explain why this is true:

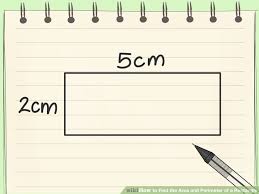
1. What it is the benefit to students of creating their own rulers with numbers centered on the individual units before using standard rulers with numbers on the hash marks?

(p. 466–467; Figure 19.5)

1. Create 2 different animals using PBS Kids Cyberchase website <http://pbskids.org/cyberchase/media/games/area/>. Take a screen shot and post your 2 animal creations below.

|  |  |
| --- | --- |
| Animal 1 | Animal 2 |
|  |  |

How do explorations with tangrams help students understand area?



1. Using the figure to the right as an example, explain **to a 4th grade student** the definitions for area and perimeter.
2. Students may have misconceptions about area formulas such as, **confusing linear and square units** and **difficulty in conceptualizing the meaning of height and base**. By providing opportunities for students to \_\_\_\_\_\_\_\_\_\_\_\_\_ formulas through inquiry based projects rather than providing formulas initially, they gain conceptual understanding of the ideas and relationships involved, and they engage in “doing mathematics.” (p. 472)
3. Read the Measurement and Data section from the grade 3, 4, and 5 TN Math Standards coversheets (p. 35, 45, and 55). Fill in the basic expectations for each grade level in connection to area, perimeter, and volume in the table below.

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| --- | --- |
| Grade Level | Expectations connected to Area, Perimeter, and Volume |
| 3 |  |
| 4 |  |
| 5 |  |

1. How can a rational number wheel as described on p. 483 (and found in Ch. 17; Figure 17.5) be used to build skills needed for measuring angles?
2. How can a number line be used to support students learning about elapsed time?

(p. 484–485)

1. How is the “think addition” strategy for subtraction useful for making change?

(p. 486 and p. 176)